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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,986	03/02/2004	Takeo Eguchi	09792909-5828	1289
26263 7590 12/20/2007 SONNENSCHN NATH & ROSENTHAL LLP P.O. BOX 061080 WACKER DRIVE STATION, SEARS TOWER CHICAGO, IL 60606-1080			EXAMINER DO, CHAT C	
			ART UNIT 2193	PAPER NUMBER
			MAIL DATE 12/20/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/790,986

Applicant(s)

EGUCHI, TAKEO

Examiner

Chat C. Do

Art Unit

2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 9-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 9-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This communication is responsive to Amendment filed 11/01/2007.
2. Claims 1-4 and 9-17 are pending in this application. Claims 1, 9, and 13 are independent claims. In Amendment, claims 5-8 are cancelled and claims 14-17 are added. This Office Action is made final.

#### ***Claim Objections***

Claim 14 is objected to because of the following informalities:

The applicant is advised to add a period (.) at the end of this claim to indicate complete claim.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4 and 9-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Agrawal et al. (U.S. 4,272,648).

Re claim 1, Agrawal et al. disclose in Figures 1-5 a signal processing apparatus (e.g. Figure 1) for receiving digital signals that are continuously related and input sequentially (e.g. after sampling and digitized by components 19 and 23 in Figure 1), performing a predetermined operation on each of sequentially input digital signals (e.g. Figures 3-5 as typical operations), and outputting a result of the operation (e.g. output of Figures 3-5 to the next operation), the signal processing apparatus (e.g. Figure 1) comprising: operation means for performing the predetermined operation on an input digital signal (e.g. multiplication process as seen in Figure 3 prior reducing word length); high-order part extraction means for extracting a necessary high-order part by rounding off a result of the operation performed by the operation means (e.g. component 63 in Figure 3); difference calculation means for calculating the difference between the result of the operation performed by the operation means and the high-order part extracted by the high-order part extraction means (e.g. component 64 in Figure 3); and feedback means for adding, to a next input digital signal, the difference value calculated by the difference calculation means or a value obtained by performing a predetermined operation on the difference value calculated by the difference calculation means (e.g. feedback as seen in Figure 3 wherein the error is feedback to the adder 62 through delay element 65 to the next sample).

Re claim 2, Agrawal et al. further disclose in Figures 1-5 a second set of continuously-related digital signals is sequentially input after completion of inputting of a first set of continuously-related digital signals (e.g. next sample is fed continuously into the system), a difference value obtained as a result of the difference calculation

performed (e.g. error signal obtained by adder 64), by the difference calculation means, on the last digital signal of the first set of digital signals or a value obtained by performing the predetermined operation on the difference value calculated by the difference means is reset to 0 or added with a particular value (e.g. most significant digital of error is either 0 or error signal from adder 64 in Figure 3), and the resultant value is added, via the feedback means, to the first digital signal of the second digital signals (e.g. by adder 62 in Figure 3).

Re claim 3, Agrawal et al. further disclose in Figures 1-5 feedback means adds, to the next input digital signal, a value obtained by multiplying the difference value calculated by the difference calculation means by a factor smaller than 1 (e.g. only the most significant digit of error signal  $e(N)$ , technically the error signal is scaled down by  $N-1$  digits as seen in Figure 3).

Re claim 4, Agrawal et al. further disclose in Figures 1-5 a digital signal acquired by means of over sampling is input to the operation means (e.g. Figure 5).

Re claim 9, it is a medium claim of claim 1. Thus, claim 9 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 10, it is a medium claim of claim 2. Thus, claim 10 is also rejected under the same rationale as cited in the rejection of rejected claim 2.

Re claim 11, it is a medium claim of claim 3. Thus, claim 11 is also rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 12, it is a medium claim of claim 4. Thus, claim 12 is also rejected under the same rationale as cited in the rejection of rejected claim 4.

Re claim 13, it is a method claim of claim 1. Thus, claim 13 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agrawal et al. (U.S. 4,272,648) in view of the admitted prior art.

Re claims 14-15, Agrawal et al. fail to disclose low-order part extraction means for extracting a necessary low-order part by rounding off the result of the operation performed by the operation means as if a lower-order value output from the lower-order part extraction means is equal to or greater than a predetermined factor, the lower-order value is rounded up to a high-order value and added to an output of the high-order part extraction means. However, the admitted prior art discloses low-order part extraction means for extracting a necessary low-order part by rounding off the result of the operation performed by the operation means as if a lower-order value output from the lower-order part extraction means is equal to or greater than a predetermined factor, the lower-order value is rounded up to a high-order value and added to an output of the high-order part extraction means (e.g. pages 2-3).

Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the low-order part extraction means for extracting a necessary low-order part by rounding off the result of the operation performed by the operation means as if a lower-order value output from the lower-order part extraction means is equal to or greater than a predetermined factor, the lower-order value is rounded up to a high-order value and added to an output of the high-order part extraction means as seen in the admitted prior art into Agrawal et al.'s invention because it would reduce error in average (e.g. page 3 lines 10-13).

Re claims 16-17, Agrawal et al. fail to disclose the rounding off a result of the operation performed by the operation means consists of rounding up if a rounded resultant is less than a predetermined figure as the rounding off a result of the operation performed by the operation means consists of rounding down if a rounded resultant is greater than a predetermined figure. However, the admitted prior art discloses the rounding off a result of the operation performed by the operation means consists of rounding up if a rounded resultant is less than a predetermined figure as the rounding off a result of the operation performed by the operation means consists of rounding down if a rounded resultant is greater than a predetermined figure (e.g. pages 2-3).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the rounding off a result of the operation performed by the operation means consists of rounding up if a rounded resultant is less than a predetermined figure as the rounding off a result of the operation performed by the operation means consists of rounding down if a rounded resultant is greater than a

predetermined figure as seen in the admitted prior art into Agrawal et al.'s invention because it would enable to reduce error in average (e.g. page 3 lines 10-13).

***Response to Arguments***

7. Applicant's arguments with respect to claims 14-17 have been considered but are moot in view of the new ground(s) of rejection.

8. Applicant's arguments filed 11/01/2007 have been fully considered but they are not persuasive.

a. The applicant argues in page 10 second paragraph for claims that the cited reference fails to disclose the rounding feature since the discarding is nearly the opposite of rounding.

The examiner respectfully submits that discarding is a type of rounding off function wherein discarding certain bit is in fact the unconditional rounding-down at that certain bit. In addition, all the independent claims do not clearly define the type of rounding-off. Thus, the feature of discard in the cited reference by Agrawal et al. can be considered as the rounding-off feature.

b. The applicant argues in pages 10-11 for claims that the component 64 of the cited reference is not or cannot be used for calculating the difference the result of operation and the high-order part extraction.

The examiner respectfully submits that the adder 64 is perfectly meet the claimed invention as the step of calculating the difference between the result of operation



(e.g. as result of summer 62) and the unconditional rounding-down result (e.g. as result of reduction 63).

- c. The applicant argues in page 11 second paragraph for claims that the cited reference by Agrawal et al. fail to disclose feedback means for adding to a next input digital signal as cited in the claimed invention.

The examiner respectfully submits that the feedback from summer 64 to summer 62 meet the claimed invention as the feedback for feeding the difference of between the result of operation and the unconditional rounding-down result to the next operation as to distribute the error to the operation.

### *Conclusion*

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do  
Examiner  
Art Unit 2193

December 16, 2007

A handwritten signature in black ink, appearing to be 'Chat C. Do', written over a horizontal line.